Translation of the pertinent portions of a response by KBA, dtd. 10/13/2005

RESPONSIVE TO THE NOTIFICATION OF THE ISR OF 07/01/2005, AMENDMENTS IN ACCORDANCE WITH ART. 34 ARE BEING FILED

1. The following are being filed

1.1 Claims
(Replacement pages 23 to 26, version of 10/13/2005)

1.1.1 New claim 1

New claim 1 was formed from original claims 1, 2, 4 and 5, as well as page 20, last paragraph, of the specification.

1.1.2 New claim 2

New claim 2 was formed from original claim 3 and from characteristics taken from page 20, paragraphs 2 and 4, page 9, paragraph 2, as well as page 20, last paragraph, of the specification.

1.1.3 Original claims 2, 4 and 5

Original claims 2, 4 and 5 are cancelled.

1.1.4 New claims 3 to 14

New claims 3 to 14 correspond to original claims 6 to 17, except for changes in the dependencies.

In the course of this, based on the cancellation of the reference numeral 16 (drive mechanism 16) in new claims 1 and 2, the definite article "the" in new claim 6 was changed to the indefinite article "a".

1.1.5 New claim 15

New claim 15 is formed from original claim 15 [sic], as well as from characteristics which can be taken from the specification on page 19, paragraph 3, page 20, paragraph 2, as well as page 9, paragraph 1. In the course of this, in the fourth portion marked by a dash the incorrect reference numeral (39) was changed to (18), and in the last portion marked by a dash the reference numeral (19) to (10). These correction clearly ensue from Fig. 10 and the associated description and therefore in our opinion do not represent an impermissible expansion.

1.1.6 New claims 16 and 17

Except for the change of "tool" to "folding blade" in claim 17, claims 16 and 17 correspond to original claims 19 and 20.

1.2 Preamble of the Specification
(Replacement/added pages 1, 4, 4a, version of 10/13/2005)

The expression "1, 3 or 18" was changed to "of claims 1, 2 or 15".

D1 and DE 198 26 625 A1 were acknowledged.

2. Re.: The Cited References

2.1 Re.: D1

D1 shows a folding blade control of a longitudinal folding apparatus, having a sensor arranged upstream of the longitudinal folding apparatus, wherein a control of the triggering time is determined as a function of a speed of the conveyed product sections detected by means of the sensor.

It does not show a sensor detecting a product phase relationship for detecting a passage time, but follows a completely different principle. In comparison with claim 1, D1 also does not show a complex system with several transport tracks, a shunt and two longitudinal folding apparatuses. In comparison with claim 2, there [rest of the sentence missing]

2.2 Re.: D2

Already acknowledged D2 shows a system of two longitudinal folding apparatuses with upstream arranged sensors, which act back on the upstream arranged shunt.

However, the sensor is neither a sensor detecting the product phase relationship for detecting a passage time, nor is it connected via a control with a drive mechanism of the folding blade for controlling the latter.

2.3 Re.: D3

D3 relates to a transverse folding device for transversely folding individual sheets. It has a folding blade inclined in the transport direction, as well as an automatic control for the position, or the correct separation, of the sheets and is embodied for being able to transversely fold sheets of paper once or several times.

It does not disclose a longitudinal folding device in a continuous in-line process of a printing press for processing product sections in the product track arranged downstream of other units (former, transverse folding apparatus).

2.4 EP 0 873 273 B1

EP 0 873 273 B1 cited in the parallel German examination process describes a drive mechanism of a transverse folding apparatus, wherein a rotatory drive mechanism is varied as a function of a relative position of a signature and a position of a gripper cylinder. EP 0 873 273 B1 shows neither a longitudinal folding apparatus nor the synchronization of an up and down movement of a folding blade via a gear.

3. Novelty and Inventive Activities

Since the characteristics of claims 1, 2 or claim 15 are disclosed in none of the mentioned documents, claim 1 and claim 2 in the present version are novel.

Since the present subject of the application relates to a longitudinal folding apparatus (in contrast to D3) which, comparable to D2, operates "in-line" with upstream arranged units of a printing press, clocking of the shunt and the folding blades of claims 1 and 15 is in our opinion used to achieve a common goal, namely for example the dependable, exact and interference-free transport of separate products section, which are to be longitudinally folded.

Starting with D2, one skilled in the art at most finds the concept described there of a speed measurement (see 2.2), and, if desired, replaces the sensors (22, 23) represented in D2, Fig. 2, by the detectors (14) of D1, which detect the speed. However, this difference, small at first blush, results in a completely different concept and therefore does not lead to the subject of claims 1, 2 or 14 [sic], but away from this.

Based on the problems connected with an in-line printing press, in particular web-fed printing press (which can be determined at least by the characteristic "former"), one skilled in the art would not even consider D3, since for one this relates to a transverse folding machine, and furthermore the machine disclosed there does not seem to be a component of an in-line production.

Starting with D2, one skilled in the art would not consider EP 0 873 273 B1, since this relates to something completely different, namely the synchronized rotatory drive mechanism in a transverse folding apparatus.

Therefore in our opinion the characteristics of claims 1, 2 or 15 do not ensue in an obvious manner from the present prior art and are based on inventive activities.

4. Interview

Should there be doubts on the part of the examining office regarding the clarity or inventive activities in the filed patent claims, an

INTERVIEW

is requested prior to the preparation of the international preliminary examination report. A quick agreement as to the date can be made by calling 0931 / 909-61 05.

Enclosures:

Claims, replacement pages 23 to 26,
Specification, replacement/added pages 1, 4, 4a,
each in the version of 10/13/2005, in triplicate

Specification

System Comprising Alternative Processing Sections for the Further Processing of Products, Longitudinal Folding Device and Method for the Synchronous Operation of a Folding Device

The invention relates to a system with alternative processing sections for the further processing of products, a longitudinal folding apparatus, as well as a method for the synchronous operation of a folding apparatus in accordance with the preambles of claims 1, 2 or 15.

In folding apparatuses, in particular for products of a rotary printing press, product sections are further processed in several successive and partially alternatively selectable processing stages. The alternative assignment of product sections to several processing stages takes place by means of a product shunt. In conventional folding apparatuses, the product shunt, as well as the tools of the subsequent processing stages, are mostly driven via gears from a main drive mechanism of the folding apparatus or its transport devices and are synchronized with them. However, if prior to their entry into the shunt and/or prior to their entry in the downstream located processing stage, the product sections are not always exactly oriented, damage to the products, a reduction in quality and/or even the stoppage of the installation can occur either in the course of the passage through the shunt or during subsequent further processing.

A product shunt of a folding apparatus with two downstream located longitudinal folding apparatuses is disclosed in DE 198 02 995 C2, wherein a sensor for detecting the phase relation of the

product is located upstream of the product shunt, and a sensor is located downstream of each of the two succeeding product sections for detecting jams in these sections. The three sensors, one sensor detecting the number of revolutions of the main drive mechanism, as well as a switching device setting a production type, are connected with a regulating arrangement for controlling

Premature folding can also occur if printed products enter the longitudinal folding apparatus delayed and driving of the folding blade (tool of the processing change) is provided by a main drive mechanism.

EP 1 211 212 A2 shows a folding blade control device of a longitudinal folding apparatus with a sensor arranged upstream of the longitudinal folding apparatus, wherein a control of the triggering time is determined as a function of the speed of the transported product sections determined by means of the sensor.

DE 198 28 625 A1 relates to a transverse folding device for the transverse folding of sheets. It has a folding blade inclined in the transport direction, as well as an automatic control for the position or the correct separation of the sheets and is embodied for being capable of transversely folding sheets of paper once or several times.

The object of the invention is based on increasing the product quality and operational dependability in a system with alternative processing section for the further processing of products and in a longitudinal folding apparatus, as well as on the creation of an appropriate method for the synchronous operation of a folding apparatus.

In accordance with the invention, this object is attained by means of the characteristics of claims 1, 2 or 15.

The advantages which can be obtained by means of the invention consist in particular in that on the one hand the product quality, and on the other hand the operational dependability (availability) of the folding apparatus, are considerably increased. This is advantageously assured by means

of the optical detection of the position of the products upstream of the two longitudinal folding apparatuses and the synchronization of the folding blade, which is driven mechanically independently from the conveying system and/or a movable buffer and/or an optical detection of the position of the products upstream of the shunt.

By means of the optical detection of the phase relation of the products directly prior to longitudinal folding it is possible to ideally synchronize the time of folding and to correct it if required. The quality is further improved if in addition movable buffers are also synchronized by means of optical detection and reduce the bumping and assure an exact product alignment.

In an advantageous embodiment a gentle braking of the products, for example printed products, is achieved at the longitudinal folding apparatus by means of the movable buffer, because the kinetic energy with which the products bump against the moving buffer is reduced in comparison with the kinetic energy

Claims

1. A system with alternative processing tracks for further processing of products (02) in longitudinal folding apparatuses (01), wherein a former, as well as a transverse folding apparatus are arranged in the product path upstream of the longitudinal folding apparatuses (01), and having a shunt (34), at which a conveying track (33) is split into a plurality of alternative transport tracks (36, 37) for further processing of the products (02) in the longitudinal folding apparatuses (01), wherein a sensor (39) which detects the product phase relation is arranged upstream of the shunt (34), whose signal acts via a control device (41) on a drive mechanism (42) actuating the shunt (34), and wherein a further sensor (18) is respectively arranged on the at least two transport tracks (36, 37), characterized in that the further sensor (18) is embodied as a sensor (18) which detects the product phase relation for determining a passage time, and that the sensor (18) is connected via a control device (10, 19) with a drive mechanism (05, 16), which is mechanically independent from the drive mechanism of the transport tracks (33, 36, 37), of a folding blade (03) of the longitudinal folding apparatus (01) which can be moved up and down relative to a folding table (04) and which controls the drive mechanism (05) of the folding blade (03) while taking the detected product phase relationship into consideration.

2. A longitudinal folding apparatus (01), upstream of which longitudinal folding apparatuses (01), as well as a transverse folding apparatus, are arranged, wherein a product (02) can be supplied to the longitudinal folding apparatus (01) over a transport track (36, 37), wherein a sensor (18) is arranged on the transport track (36, 37) upstream of the longitudinal folding apparatus (01), characterized in that the sensor (18) is embodied as a sensor (18) which detects the product phase relation for determining the passage time, and the sensor (18) is connected via a control device (10) with a drive mechanism (05, 16), which is mechanically independent from the drive mechanism of the transport tracks (33, 36, 37), of a folding blade (03) of the longitudinal folding apparatus (01), which controls the drive mechanism (05)

while taking the detected product phase relationship into consideration, and that the drive mechanism (05) is embodied as a motor (05), which lowers or raises the folding blade (03) in relation to a folding table (04) via a gear of the folding blade (03) in a clocked manner.

3. The system in accordance with claim 1 or the longitudinal folding apparatus (01) in accordance with claim 2, characterized in that the blade (04) is seated on at least one lever, which can be pivoted in respect to a folding table (04).

4. The system in accordance with claim 1 or the longitudinal folding apparatus (01) in accordance with claim 2, characterized in that the longitudinal folding apparatus (01) has a movable buffer (13, 14), which slows down a product (02) entering the longitudinal folding apparatus.

5. The system or the longitudinal folding apparatus (01) in accordance with claim 4, characterized in that the buffer (13, 14) can be moved along the braking path (24) of the printed products (02, 22) at a lesser speed than the entry speed (v_0).

6. The system or the longitudinal folding apparatus (01) in accordance with claim 4, characterized in that the drive mechanism (16) which is mechanically independent of the drive mechanism of the transport tracks (33, 36, 37) is embodied as the drive mechanism (16) of the buffer (13, 14).

7. The system or the longitudinal folding apparatus (01) in accordance with claim 6, characterized in that the drive mechanism (05) of the folding blade (03), as well as the drive mechanism (16) of the buffer (13, 14), are controlled by employing the signal from the sensor (18).

8. The system or the longitudinal folding apparatus (01) in accordance with claim 4, characterized in that the movable

buffer (13, 14) is arranged on an endless belt (12) running on the circumference of a rotatable body (15) which extends at least by a section into the braking path (24).

9. The system or the longitudinal folding apparatus (01) in accordance with claim 4, characterized in that the movable buffer (13, 14) is arranged on a moving endless belt (12) having a section which extends parallel with the braking path (24).

10. The longitudinal folding apparatus (01) in accordance with claim 2, characterized in that a shunt (34) is arranged upstream of the longitudinal folding apparatus (01), by means of which the products (02) can be alternatively supplied to the longitudinal folding apparatus (01) or another processing stage (01).

11. The longitudinal folding apparatus (01) in accordance with claim 10, characterized in that a sensor (39), which detects the product phase relationship, is arranged upstream of the shunt (34), whose signal acts via a control device (41) on a drive mechanism (42) which actuates the shunt (34).

12. The system in accordance with claim 1 or the longitudinal folding apparatus (01) in accordance with claim 11, characterized in that the control device (41) is designed for synchronizing an operating position of the shunt (34) with the detected product phase relationship by employing the signal from

the sensor (39).

13. The system in accordance with claim 1 or the longitudinal folding apparatus (01) in accordance with claim 2, characterized in that the control device (10, 19) is designed for synchronizing the movement of the folding blade (03) with the detected product phase relationship by employing the signal from the sensor (18).

14. The system or the longitudinal folding apparatus (01) in accordance with claim 4, characterized in that the control device (10, 19) is designed for synchronizing the movement of the

buffer (13, 14) with the product phase relationship by employing the signal from the sensor (18).

15. A method for the synchronous operation of a folding apparatus with alternative processing paths, wherein

- a product phase relationship is determined by means of a sensor (39) arranged upstream of a shunt (34),
- by means of standards fixed for the production, the product flow is conducted by means of the shunt (34) into a selected processing path or is split into several processing paths,
- in that an operating position of the shunt (34) is synchronized with the product phase relationship on the basis of the signals from the sensor (39),
- a product phase relationship, i.e. a passage time, is determined prior to or at the time of entry into the processing stage (01) by means of a second sensor (18), which is arranged downstream of the shunt (34) and upstream of a processing stage (01),
- and a drive mechanism (05) for a raising or lowering movement relative to the folding table (04) of a folding blade (03) of the processing stage (01) for processing the product is synchronized with the product phase relationship by means of the signals from a second sensor (18) by a second control device (10).

16. The method in accordance with claim 15, characterized in that the synchronization of the operating position of the shunt

(34) with the product phase relationship takes place by means of a first control device (42).

17. The method in accordance with claim 15, characterized in that the synchronization of the movement of the folding blade (03) with the product phase relationship takes place by means of a second control device (10).